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Title:	UNIFIED MESSAGING AND LONG DISTANCE COMMUNICATION SYSTEM	
Document Type and Number:	Wipo Patent WO/1996/020553	Kind Code: A2
Link to this page:	http://www.freepatentsonline.com/WO1996020553.html	
Abstract:	<p>The present invention relates to a unified messaging and communication system which is more convenient and cost effective. This system advantageously combines or makes use of existing communication channels or networks. Part of the system and method relies on an intermediate leg of the distribution network being an INTERNET segment. Telephone communication is typically used for initial or final legs. Voice mail, E-mail, facsimiles and real time voice telephone communications are completed by the system. Mail communications may be centralized and retrieval of messages can be accomplished using one of a number of separate and distinct approaches. Thus, INTERNET can be used to form global voice mail and facsimile mail systems.</p>	
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Application Number:	PCT/CA1995/00723	
Filing Date:	12/22/1995	
Publication Date:	07/04/1996	
Referenced by:	View patents that cite this patent	
Export Citation:	Click for automatic bibliography generation	
Assignee:	ALPHANET TELECOM INC.	
International Classes:	G06Q10/00; H04L12/58; H04L29/06; H04M3/53; H04M3/533; H04M7/00; H04M7/12; H04Q3/00	
Claims:	<p>THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIM</p> <p>1. ED ARE DEFINED AS FOLLOWS. A method of forming a long distance communication channel between two telephone devices each of which are connected to a PSTN, said method comprising a user of one of said telephone devices initiating and establishing a telephone communication with a first commercial access provider node of INTERNET and providing thereto a telephone address, using INTERNET to establish a communication channel between said first commercial access provider node and a second commercial access provider node of INTERNET and providing said telephone address to said second commercial access provider node, said second commercial access provider node using said telephone address and a telephone dial out capability of said second commercial access provider node to establish a communication with a telephone device at the telephone address using a PSTN, and using the INTERNET communication channel to link said telephone devices and form a real time voice communication between said telephone devices.</p> <p>2. A method as claimed in claim 1 including, after initiating said telephone communication with said first commercial access provider node, said first commercial access provider node communicates with said user</p>	

to establish authorization for completing a long distance communication.

3. A method as claimed in claim 1 wherein said first and second commercial access provider nodes encrypt signals therebetween and decrypt received signals such that signals transmitted over INTERNET are encrypted.

4. A method as claimed in claim 1 wherein said telephone devices are conventional telephones.

5. A method as claimed in claim 4 wherein signals transmitted between said commercial access nodes using INTERNET are encrypted.

6. A method as claimed in claim 1 wherein each commercial access provider node distinguishes between voice and facsimile transmissions and assigns a higher priority channel on INTERNET to voice transmissions.

7. A method as claimed in claim 1 wherein the originating telephone device has a predetermined arrangement with said first commercial access provider node and said second telephone device has no prior relationship with either of said commercial access provider nodes.

8. A method as claimed in claim 5 wherein each commercial access node has different DID telephone addresses for voice and facsimile transmissions.

9. A method of establishing a long distance telephone communication between an initiating telephone device and a receiving device telephone identified by a telephone address, said method comprising using a PSTN to initiate a telephone communication with a commercial access provider node of INTERNET services and provide the node with said telephone address, said commercial access provider node causing a real time voice communication channel to be formed between said telephone devices, which communication channel includes an INTERNET segment between said commercial access provider node and a further commercial access provider node and a PSTN segment between said further commercial access provider node and the telephone device identified by the telephone address, wherein the further commercial access provider node uses the telephone address and the PSTN to initiate the PSTN segment therebetween.

10. A method as claimed in claim 9 wherein said telephone devices are conventional telephones.

11. A method of forming a long distance telephone communication between a first telephone device and a second telephone device which communication is capable of transmitting real time voice communications similar to existing long distance telephone communications, comprising the steps of forming an initial telephone link between the first telephone device and a commercial access provider node of INTERNET services and providing thereto a telephone address of the second telephone device, said commercial access provider forming an appropriate INTERNET communication channel with a further commercial access provider node located in closer proximity to the location of the second telephone device and providing thereto said telephone address, said further commercial access provider establishing a telephone link with said second telephone device using said telephone address, and then linking said telephone devices using said INTERNET communication channel thereby forming a real time voice communication between said telephone devices.

12. A method as claimed in claim 11 wherein said second telephone device requires no prearrangement with said further commercial access provider node.

13. A communication arrangement for long distance telephone to telephone voice communication comprising a first provider node of INTERNET services having means to allow users to initiate a telephone communication with a desired telephone device identified by a telephone address by the steps of initially forming a communication with said first provider node and providing said telephone address thereto, said first provider of INTERNET services cooperating with a second provider node of INTERNET services to form a real time voice communication channel therebetween and said second provider node of INTERNET services including dial out capabilities which are used upon receipt of the telephone address provided thereto to form a telephone communication with the telephone device, said second provider cooperating with said first provider node to link the telephone devices using an INTERNET segment between said provider nodes and using PSTN segments between the initiating telephone device and the first provider node and between the second commercial access provider node and said telephone device identified by said telephone address, wherein the first and second INTERNET provider nodes appropriately process the signals for transmission on INTERNET.

14. A communication arrangement as claimed in claim 13 wherein the signals transmitted over INTERNET are encrypted by said commercial access provider nodes.

15. A long distance telephone communication arrangement having three distinct communication segments, comprising a first communication segment which carries voice communication over a PSTN between a first telephone device and a first commercial access provider node of INTERNET, a second segment between

said first commercial access provider node and a second commercial access provider node of INTERNET which exchange digitized voice packets therebetween over INTERNET based on communications received from the first and third segments, said third segment carrying voice communication over a PSTN between a second telephone device and said second commercial access provider node after said second commercial access provider node has established said third segment with said second telephone device.

16. A long distance telephone communication arrangement as claimed in claim 15 wherein said first and second commercial access provider nodes carry out all necessary signal conversion to and from the first and third segments.

17. A long distance telephone communication arrangement as claimed in claim 15 wherein said first and second commercial access provider nodes encrypt signals transmitted on the second segment.

18. A long distance telephone communication arrangement as claimed in claim 15 wherein said first and second commercial access provider nodes convert the signals for transmission by the second segment to a different form relative to the signals carried by the first and third segments.

19. A long distance telephone communication arrangement having three distinct communication segments for transmitting a signal, comprising a first communication segment which carries voice communication over a PSTN between a first telephone device and a first commercial access provider of INTERNET, a second segment between said first commercial access provider and a second commercial access provider of INTERNET which exchange digitized voice packets therebetween based on communications received thereby, and a third segment which carries voice communication over a PSTN between a second telephone device and said second commercial access provider of INTERNET and wherein said first and second commercial access providers convert the signal to and from the first and third segments whereby the signal carried by the second segment is in a form different from the signal carried by at least one of the first and third segments.

20. A long distance telephone communication arrangement as claimed in claim 19 wherein said second commercial access provider of INTERNET establishes said third segment with said second telephone device by outdialing the telephone address of said second telephone device provided thereto by said first provider which received the telephone address in a communication from said first telephone device.

21. A long distance telephone communication arrangement comprising an INTERNET segment between at least two commercial access providers of INTERNET, said commercial access providers cooperating to form a communication channel having a real time INTERNET communication segment, said communication channel linking a first telephone device and a second telephone device, said communication channel being established upon receipt of an initial telephone communication with one of said commercial access providers from said first telephone device which communication includes a telephone address of the second telephone device, and thereafter said telephone address is transmitted over INTERNET to the other commercial access provider which uses the same to form a telephone communication with said second telephone device identified by the telephone address, and thereafter said telephone devices are connected using the INTERNET segment.

22. A communication system comprising at least one commercial access providing computer associated with INTERNET to allow subscribers to use the services offered by INTERNET, said communication system having many registered subscribers who are collectively unrelated, providing each subscriber with an Email address for INTERNET, a fax telephone address and a voice mail telephone address, where a message addressed to any of the addressee results in the commercial access providing computer receiving and storing the addressed message for retrieval by the respective subscriber, said commercial access providing computer allowing each subscriber to access and retrieve messages stored on his behalf or a summary of messages stored on his behalf by using either a telephone set which forms a telephone communication with said commercial access providing computer or using a computer and modem which forms a telephone communication with said commercial access providing computer.

23. A communication system as claimed in claim 22 wherein retrieval of messages stored on behalf of a subscriber includes using a facsimile machine which forms a communication with said commercial access providing computer and delivers Email and facsimile messages to the facsimile machine.

24. A communication system as claimed in claim 22 wherein use of said fax address and said voice mail address are telephone numbers which when used form a communication with said commercial access providing computer over one of many direct in dial telephone lines.

25. A communication as claimed in claim 22 wherein some of said subscribers have received Email messages addressed to the subscriber automatically converted by said commercial access providing computer to a facsimile format and forwarded as a facsimile transmission to a facsimile address of the subscriber.

26. A communication system as claimed in claim 23 wherein said commercial access providing computer broadcasts an alert signal to advise receiving equipment of subscriber that a message has been received

by said commercial access providing computer on behalf of said subscriber.

27. A communication system as claimed in claim 22 wherein said commercial access providing computer provides each subscriber the capability to receive an audible summary of messages received for the subscriber using a telephone communication between the subscriber and said commercial access providing computer.

28. A communication system as claimed in claim 22 wherein at least two commercial access providing computers are connected to INTERNET and use INTERNET to exchange information therebetween, and wherein subscribers of the system can access either of said at least two commercial access providing computers for retrieval of messages store by the computers on behalf of a subscriber.

29. A communication system as claimed in claim 28 wherein messages stored for a subscriber in one of said computers are transferred to the other computer using INTERNET when said other computer is contacted by the subscriber for retrieval of communications stored on his behalf.

30. A communication system as claimed in claim 29 wherein said computers are located in different geographic areas where it is cost effective to use INTERNET to communicate between said commercial access providing computers when a subscriber contacts said other computer for retrieval of messages stored on his behalf.

31. A communication system as claimed in claim 30 wherein each subscriber has the ability to contact the commercial access providing computer and have said computer use INTERNET for long distance voice transmission of telecommunications of a subscriber.

32. A unified messaging system comprising a computer system having a bank of direct in dial telephone lines associated with a public switched telephone network and said computer system also acting as a commercial access provider for a high speed data communication network through which Email is delivered, said computer system providing each subscriber with an Email address for data communication access, a fax telephone address and a voice mail telephone address, where a message addressed to any of the addresses results in the computer system receiving and storing the addressed message for retrieval by the respective subscriber, said computer system being accessible to any subscriber using said public switched telephone network to connect with said computer or using a PSTN and said high speed data network to connect with said computer for retrieval of messages stored on behalf of said subscriber or a summary of said messages whereby said subscribers may contact a single automated source for retrieval of voice mail, Email or facsimile messages received on its behalf by said computer system.

33. A communication system as claimed in claim 32 wherein use of said fax telephone address or said voice mail telephone address of some subscribers attempts to make a communication with equipment of the particular subscriber and, if unsuccessful, is automatically call forwarded to said commercial provider for receiving and storing.

34. A communication system as claimed in claim 33 wherein said voice mail address and said fax mail address are the same address and said computer system distinguishes between a facsimile message and a voice message and provides appropriate prompts for receiving and storing the appropriate message.

35. A communication system as claimed in claim 32 wherein said computer system converts at least some of said messages into an Email or a facsimile message and cooperates with equipment used by subscribers for automatic delivery of received and stored messages.

36. A communication system as claimed in claim 32 wherein said computer system has at least some subscribers where Email and facsimile messages are automatically converted to either Email or facsimile format and then forwarded to the subscriber.

37. A communication system as claimed in claim 32 wherein said computer system provides a summary of messages received on behalf of a subscriber which summary can be retrieved as a voice message.

38. A communication system as claimed in claim 32 wherein said computer system provides a summary of messages received on behalf of a subscriber which summary can be retrieved as voice mail, Email or a facsimile message.

39. A communication system as claimed in claim 36 wherein said computer system includes a conversion arrangement whereby a received facsimile transmission can be stored and retrieved as a text file, or a received text file can be retrieved as a facsimile message.

40. A method of receiving voice, Email, and facsimile messages addressed to a subscriber which messages are received by a computer system connected to a data communication network through which Email is received and transmitted and wherein the computer system has many direct in dial telephone lines connected to a public switched telephone network by means of which facsimile messages and voice messages are received and transmitted, and wherein subscribers may retrieve messages stored on his

behalf using said public switched telephone network and said data communication network directly associated with said computer system or using said public switched telephone network to form a direct connection with said computer system for retrieval of messages

41. A method as claimed in claim 40 wherein said computer system is linked by said data communication network to at least one further computer and wherein each subscriber may access either of said computers and retrieve messages received and stored on its behalf with said computers communicating the messages therebetween through said data communication network.

42. A method as claimed in claim 41 wherein said computers each receive messages from subscribers sent thereto for more cost effective transmission, said received messages being addressed to a particular telephone address, and wherein said messages are routed using said data communication network to one of said computers located in closer proximity to the telephone address and wherein said one computer forwards the message to said telephone address using a public switched telephone network.

Description:

TITLE: UNIFIED MESSAGING AND LONG DISTANCE COMMUNICATION SYSTEM

FIELD OF THE INVENTION The present invention relates to a method and system for unified messaging services, and in particular relates to a system and method which makes voice mail, facsimile mail and E-Mail conveniently accessible to receive as well as to transmit and to allow crossover in both the type of document that is received or transmitted. The retrieval of messages can be accomplished in a number of distinctly different manners whereby the user has significantly more freedom and choice regarding message retrieval.

BACKGROUND OF THE INVENTION

INTERNET now provides a network where a subscriber typically contracts with a commercial access provider (CAP) and obtains an INTERNET address as well as the capability to send and receive E-Mail on INTERNET and perform other functions which INTERNET supports. The subscriber typically uses his personal computer and modem to contact the commercial access provider using the public switched telephone network (PSTN), and once connected to INTERNET, performs the desired functions. The CAP provides an E-Mail box for the subscriber and the subscriber, when connected to the CAP, can review the contents of this electronic mailbox.

E-Mail can be transmitted to other subscribers of INTERNET located in a host of different countries and provides a cost effective system for transmitting data from one E-Mail subscriber to another across different E-Mail systems nationally or internationally.

E-Mail systems have been available for many years and although they provide a very cost effective alternative to facsimile transmissions, the popularity of E-Mail does

not nearly approach the popularity of voice and facsimile messaging and the number of users is many times lower. Our United States Patents 4,713,837, 4,922,518, 4,042,569 and 4,969,184 disclose systems for more efficient transmission and/or retrieval of facsimile communications which can involve the use of dedicated data transmission networks. Facsimile transmissions have been rerouted in the case of long distance transmissions to a computer who uses a data communication to provide a more effective link to another computer which then uses the public switched telephone network to phone out and complete the transmission.

Companies have examined the approaches for conducting business and, in many cases, it is now felt in certain individuals within the company require their own private facsimile address as well as a convenient method for receiving voice mail. Confidentiality may also be important. Office workers have also become much more familiar with computer equipment and have become more comfortable using the computer equipment to transmit or receive certain messages or conduct searches on different electronic databases.

The present invention has recognized the need for system of transmission and central approach for combining these different message types. The invention also allows the many millions of facsimile machines throughout the world to be more cost effectively accessible by other facsimile machines and computers and where the message tv can be in addition to a traditional facsimile message.

SUMMARY OF THE INVENTION

A messaging system according to the present invention having a bank of direct-in-dial (DID) telephone lines associated with a public switched telephone network and a computer system which also acts as a commercial access provider for the INTERNET or other data communication networks through which digital messages can

be delivered. The computer system provides each subscriber with an E-mail address and account for the data communication network, as well as a fax telephone address and a voice mail telephone address, where a communication addressed to any of the addresses results in the computer system receiving and storing the particular message in an electronic messaging mailbox for retrieval by the respective subscriber. The computer system is accessible to any subscriber using the public switched telephone network and/or the data network for retrieval of communications stored on behalf of the subscriber or a summary of the communications whereby the subscribers may contact a single automated source for retrieval of voice mail, E-mail, data files, or facsimile transmissions received on its behalf by the computer system. Similarly, the system is accessible to anyone wishing to leave a voice, facsimile, or other message for the subscriber by dialing the telephone number associated with the subscriber's electronic message mailbox. As a result, data networks, such as INTERNET, are accessible by devices other than computers, namely by telephones and facsimile terminals.

In the preferred embodiment, the voice mail and facsimile mail telephone addresses are the same and the computer distinguishes between the two types of communications when the in-bound call is received. Use of any of the addresses results in a connection with the commercial access providing computer which stores the addressed communication in an electronic messaging mailbox for retrieval by the respective subscriber. The commercial access providing computer allows each subscriber to access and retrieve communications stored in his electronic messaging mailbox or a summary of communications stored in his electronic mailbox. The retrieval can be carried out using any of (1) a telephone set which forms a telephone communication with a suitable commercial access providing computer, or (2) a computer and modem which forms a

telephone communication with a suitable commercial access providing computer, or (3) a facsimile machine which form a telephone communication with a suitable commercial access providing computer. According to yet a further aspect of the invention the commercial access providing computer with respect to some subscribers converts received E-Mail and other communications addressed to the subscriber to a facsimile format such that the messages may be delivered to a predetermined facsimile address designated for receipt of messages sent to the subscriber. In this way, the subscriber can have an E-Mail address which others can use to provide them with information, but he has predetermined that he, on occasion or always, wants to receive this as facsimile communication or other specified communication.

The communication system can also operate where the commercial access providing computer includes an arrangement for automatically delivering an alert signal means of a broadcast which is received by the equipment of the subscriber, and the reception thereof instructs the subscriber's equipment to automatically receive the communications by initiating a communication with the commercial access providing computer and then retrieving the communication. In this way, the communication system can provide automatic delivery of communications, given that the subscriber's equipment is available at that time.

This communication system can also work as a global voice mail and fax mail system where, if a particular line is busy or not answered, the call is diverted to a suitable commercial access providing computer which will receive the diverted communication which is forwarded to the communication system. This method uses the call forwarding technology of existing public switched telephone networks and thus, the communication system provides the subscriber with the ability to receive all communications, including voice and fax messages.

According to yet a further aspect of the invention, the communication system includes at least two commercial access providing computers, each interconnected to the INTERNET, and wherein the subscribers to the system can access either of the two commercial access providing computers for retrieval of communications stored on behalf of the subscriber. Information is effectively exchanged between the two commercial access providing computers when necessary to allow retrieval of the information by the subscriber by accessing either of the computers. This effective communication between the computers using the INTERNET, allows a fast, reliable and cost-effective transfer of information. Such a system has the benefit of providing the subscriber with access to the closest commercial access providing computer and can reduce long distance charges as well as improve the quality of the communication channel, as typically a local or shorter long distance call is required to connect with the particular commercial access providing computer. Thus, INTERNET becomes the transport backbone of a global voice and fax mail system and opens INTERNET to transparent access by telephones, facsimile terminals and other non-subscriber devices.

The present invention is also directed to a unified messaging system comprising a computer system which is connected to a public switched telephone network and a high speed data communication network through which E-Mail, facsimiles and voice mail may be transferred.

The invention is also directed to a method of transmitting of voice, E-Mail and facsimile messages destined for a particular identified subscriber, which messages are received by a computer system of a commercial access provider connected to a data communication network through which E-Mail is transported. The computer system is also connected to a public switched telephone network by means of which facsimile transmissions and voice transmissions are received and transmitted, and wherein a subscriber may access the

computer for retrieval of messages stored in his electronic message mailbox or on his behalf. The retrieval of messages uses the public switched telephone network and the data communication network directly connected to access the subscriber's electronic message mailbox or retrieval can utilize the public switched telephone network to form a direct connection with the computer system for retrieval of messages. This method provides the subscriber with a number of alternatives for accessing his particular electronic message mailbox including using the data communication network to access his mailbox when this is the most desirable or cost effective manner to retrieve the communications.

INTERNET provides access to millions of computers throughout the world. The present invention, preferably uses INTERNET and provides access to hundreds of millions of telephones and fax machines resulting in a Global Voice Mail and Fax Mail System in addition to the existing capabilities of INTERNET.

The present invention is also directed to a long distance telephone communication system which uses INTERNET to form part of the communication link and PSTNs for forming an originating and a final link. Commercial access providers of INTERNET cooperate with telephone devices whereby this communication is possible without highly sophisticated users and computers at either end of the communication link. The sophistication for INTERNET real time communication is provided at commercial access provider nodes and the telephone devices can be conventional phones. The invention includes method and apparatus used to implement this cost effective long distance communication.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention are shown in the drawings, wherein, Figure 1 is an overview of the unified messaging service and how it can interact with a data communication network.

Figure 2 is an overview showing certain features of the system, and in particular the type of structure used to unify the various communication messages of a subscriber and a common electronic mailbox and the various means for retrieval of the information.

Figure 3 shows an overview of how the system can be used to effectively connect a subscriber to the data communication network and to his individual electronic mailbox for effective retrieval of messages. Figure 4 is an overview showing an effective manner for delivering a facsimile in a cost effective manner, and

Figure 5 shows a schematic of how the system can be used to complete a voice communication channel to a telephone set in a distant geographical location.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The term "UniPost" will be used to describe a new type of commercial access provider of the type associated with INTERNET. UNIPOST™ provides dial-in access to its subscribers through specialized access computers called UniPost Access Nodes (UANs) located in different geographical regions (see Figure 1). Each UniPost Access Node provides a subscriber with an E-Mail address and account, preferably an INTERNET address, for example, jsmith@acmefireworks.com.

This address provides access to the subscriber for other INTERNET subscribers, and for subscribers to services that have gateways into INTERNET. In addition, the subscriber is provided with a Personal Mailbox Telephone Number, for example, 1-416-555-1234, and Personal ID Number (PIN): 63265. Therefore, a UniPost subscriber may be provided with the following, INTERNET Address, gordon@cronix.unipos.com

Personal Mailbox Number: 1-416-555-1234 Personal ID Number or password: 63265

The UniPost Access Node provides the subscriber with access to all normal facilities of INTERNET, including

E-Mail, databases, conferences, and forums. The UniPost Personal Mailbox Number provides the subscriber with an access point which can receive messages from terminals other than computers, specifically from telephones and facsimile machines. Thus, his Personal Mailbox Number allows for receipt of voice and facsimile messages. With this arrangement, the subscriber can be contacted by the

millions of PC users in the world familiar with E-mail, as well as the hundreds of millions of telephone and facsimile devices now in use. Furthermore, the various received communications are received by a centralized system and can be retrieved by the subscriber his or her convenience. The fact that the various UniPost Access Nodes are distributed throughout various countries and the world and connected by the INTERNET or another commonly available data communication network makes retrieval of messages more effective. Furthermore, each UniPost Access Node can include arrangements for converting of various communications from one form to another making retrieval easier and more flexible. For example, a subscriber may not wish to actually receive E-Mail as E-Mail, but may wish to have an E-Mail address. When a communication is addressed to him using the E-Mail address, the UniPost Access Node may convert it to a facsimile transmission and send it out to the subscriber as a facsimile transmission. In this way, the subscriber need not have the capability of receiving all transmissions and can use certain features of the UniPost Access Nodes for conversion of communications received in one form to another form. The UniPost access node can also provide conversion of facsimile transmissions to E-Mail, or E-Mail to speech. In this way, subscribers need not have their own conversion hardware and/or software.

Turning to Figure 1, the communication system 2 includes the INTERNET 4, which is a well known communication network. INTERNET has a number of INTERNET commercial access providers (CAPs) 8 which each have a host

of subscribers who then have access to the various services of INTERNET typically using their personal computers. The conventional INTERNET access provider would provide each subscriber with an INTERNET address and password number for retrieval of E-Mail. One such subscriber 22 is shown using the local public switched telephone network 10 to gain access to the generic INTERNET CAP for transferring a file to E-Mail subscriber "gordon@toronto.UniPost.com" indicated as 12. This is via the Toronto UniPost Access Node 6, which includes the electronic Mailbox of Gordon. Gordon can either be alerted that an E-Mail communication has been received or may call in to the UniPost Access Node 6 from time to time, as indicated by line 24, go through the necessary protocol with the UniPost Access Node 6 or any UAN worldwide, and eventually receive the E-Mail, or other voice, facsimile, or other messages indicated by line 26.

Messages to the UniPost INTERNET subscriber 12 can also be made from a facsimile machine 14, from a telephone set 16, from a computer modem connection indicated as 18, or a message via Binary File Transfer (BFT) indicated by the apparatus 20. Each of these devices communicate to the UniPost Access Node 6 through the local public switched telephone network 10 and effectively gain access to the electronic mailbox of gordon@toronto.unipost.com provided by the UniPost Access Node. Note that both voice messages and facsimile messages are sent to the same telephone address and Toronto UniPost Access Node 6 distinguishes between these two types of transmissions and stores the communication in the appropriate electronic message mailbox, as will be fully described with respect to Figure 2. Again, the communications can be accessed by the UniPost INTERNET subscriber 12 making contact with the Toronto UniPost Access Node 6 or any other UAN worldwide and retrieving of communications that have been received for the subscriber. It can also be appreciated that forced delivery can occur if the subscriber has a piece of equipment which can receive an alert signal and then form a

with the UniPost Access Node. In this way, the UniPost Access Node does not have to continue to try to make contact with the subscriber and the subscriber's equipment only calls into UniPost Access Node 6 when a transmission has been received and can now be retrieved. Our earlier patents disclose automatic retrieval of facsimile transmissions which can be used in this application for message retrieval.

The Toronto UniPost Access Node can also deal with the various communications received for a subscriber in different manners. For example, a subscriber may wish to have UniPost Access Node maintain communications for a certain period of time, even after they have been delivered to the subscriber. In contrast, other subscribers may wish to have all messages abandoned once they have been delivered. Therefore, the preferences of the individual subscriber can be accommodated according to selections made at the time of retrieval or according to a predetermined arrangement. Thus, to a caller calling a UniPost subscriber from a telephone, the UAN will behave like a voice mail system. For callers calling a UniPost subscriber from a facsimile machine, the UAN will behave like a receiving facsimile machine. Likewise, the subscriber can use a telephone, facsimile machine or computer to retrieve his messages for any UAN. A telephone will facilitate playback and management of voice messages, indication of other message types and mailbox status, and possibly text-to-speech conversion of E-Mail. A facsimile machine will facilitate retrieval of facsimile messages, display of E-Mail, and notification of other message types and mailbox status. A computer will facilitate retrieval and management of all message types, including voice, facsimile, E-Mail, video and any other file type. UniPost software resident in the computer will allow for the convenient retrieval, playback, viewing, filing and general management of all

message types .

A UniPost Access Node 6, which has a host of direct in-dial telephone lines indicated as 11, can also have out-dial lines for contacting of subscribers or destined terminals. The UniPost INTERNET subscriber 12 need not always be in the form of a portable computer and the subscriber can have his messages delivered to a permanent computer or a facsimile machine, when appropriate. For example, a file transfer from 22 to a facsimile machine of the subscriber can occur where the Toronto UniPost Access Node converts the communication to a facsimile communication and then forwards the communication to the particular facsimile machine. This type of communication conversion occurs transparently to the sender.

Turning to Figure 2, it can be seen that the Toronto UniPost Access Node 6 includes a hard disk 50 which is subdivided to provide each subscriber with a separate electronic message mailbox, generally shown as 30. Within the electronic mailbox is, typically, a facsimile in-box 32, a voice in-box 34, an E-Mail box 36 and a facsimile out-box 38. Figure 2 shows how the subscriber can retrieve various communications stored in his electronic mailbox. The Toronto UniPost Access Node 6 will include a summary of the various messages that have been received for the subscriber. This summary is available to the subscriber in voice form, facsimile form or E-Mail form depending on the type of terminal used for retrieval. The retrieval of messages in the electronic mailbox using a computer and modem shown as 12 can follow the conventional practice, however, E-Mail, voice, facsimile, and other message types can be retrieved by the computer. The facsimile message can be processed using an optical character recognition arrangement within the UniPost 6 to provide a text file, or it can be merely sent as a graphic image. Therefore, the system does provide the computer terminal and modem 12 with the means to retrieve additional communications other than merely E-Mail messages. Furthermore, voice messages may be

sent to the computer and replayed through speakers or the voice messages may be converted into text communications.

Figure 2 also illustrates how the facsimile machine 25 or the telephone set 27 can retrieve information. For example, if the subscriber is at the facsimile machine 25 and wishes to retrieve messages, he can contact the Toronto UniPost Access Node 6, key in his particular password, and direct the UniPost Access Node to send the facsimile message to the machine preferably directly without forming a further communication. On the other hand, the subscriber could use the telephone set 27 to get a summary of messages received as well as any voice messages, and then direct the Toronto UniPost Access Node 6 to send E-Mail or facsimile messages to the facsimile machine 25. Any communications received for the subscriber are placed in the appropriate box within the electronic mailbox 30. Therefore it can be seen that the Toronto UniPost Access Node 6 and other UniPost Access Nodes have the capability of communicating with the subscriber in a number of different manners and allow him to receive information regarding messages received and for the transfer of the messages to him in a number of forms. The subscriber need not have a computer and modem connection to the UniPost Access Node to effectively have information or messages sent out in a particular manner.

Figure 2 shows UniPost Access Nodes 6 in Toronto New York and Tokyo. Access nodes can be distributed throughout a country. All major cities may have UniPost Access Nodes. Thus, each country typically will have many UniPost Access Nodes.

Figure 3 shows other advantages of the system which are particularly appropriate with respect to subscribers who travel and often are quite distant from their particular UniPost Access Node. In this case, the "gordon@toronto.unipost.com" UniPost INTERNET subscriber, generally indicated as 12, is in Japan and uses the local public switched telephone network 10 to contact the Tokyo

UniPost Access Node 6. After proper identification of the subscriber, the Tokyo UniPost Access Node uses INTERNET 4 to access the electronic mailbox 30 of the subscriber and allows retrieval of the various contents of the various boxes. For example, the personal computer 12 can receive voice messages, facsimile messages, E-Mail and file transfer, or the INTERNET subscriber 12 could use the telephone set 29 to retrieve voice messages and possibly the voice summary of messages received and have them played back to him. Furthermore, E-Mail or facsimile messages can be directed by the subscriber to a facsimile machine, shown as 31. Therefore, both access to the system and retrieval of information is not limited to a single technology, but can make use of a personal computer and modem connection, a telephone set connection, or a facsimile machine connection with one of the UniPost Access Nodes for both accessing a mailbox and retrieving the contents thereof. It can also be appreciated that the example shown in Figure 3 has allowed the subscriber 12 to form a relatively local connection using the public switched telephone network 10 to contact the Tokyo UniPost Access Node 6. This is then connected to the Toronto UniPost Access Node 6 and the electronic mailbox of the subscriber via an

INTERNET or dedicated data communication channel, information is retrieved from the mailbox and provided to the UniPost Access Node, also by this data communication channel provided by INTERNET. In contrast to a single UniPost Access Node, the multiple access nodes, shown in Figure 3, advantageously use the dedicated data communication network to interconnect the access nodes and reduces the need for long distance telephone communications with a particular computer. For example, if the UniPost INTERNET subscriber 12 in Figure 3 was merely a subscriber to the generic INTERNET access provider shown as 8, he would have to use the local public switched telephone network as well as a long distance telephone network to access the generic INTERNET access provider 8. This access provider would

then deliver the information back to the subscriber. This results in a long distance telephone communication which is not capable of transmitting the data at the same rate or accuracy as the INTERNET system and results in a system which is not as convenient or cost effective as the UniPost system described above. There can be a host of UniPost Access Nodes distributed throughout a country.

Figure 4 shows how a facsimile transmission addressed to a particular address in Japan can effectively use the UniPost access system. In this case, the transmission is sent from the facsimile machine 60 via the public switched telephone network 10 to the UniPost Access Node 6. The facsimile machine 60 can include add-on devices to cause this long distance call to be rerouted or the communication may first be made to the Toronto UniPost Access Node and thereafter to the Japanese address. Therefore, in this case, the user provides the direction to initiate the contact with the Toronto UniPost Access Node 6. The Toronto UniPost Access Node 6 recognizes that it is a transmission to be received in Japan, receives the transmission, and then uses the INTERNET data transmission system 4 to transfer the facsimile to the Tokyo UniPost Access Node 8. The Tokyo UniPost Access Node 8 then uses the public switched telephone network 10 to deliver the UniPost to the particular address identified in the original transmission. With this arrangement, the facsimile has been recognized as being a data transmission and redirected to make use of a data communication system and then receive the communication in a geographical location much closer whereby the local public switched telephone network may be effectively used. With this arrangement, the facsimile transmission is carried over a data communication channel the greatest distance and in a cost effective and accurate manner, and the public switched telephone network is then used to deliver the message. Similarly, a local connection with the public switched telephone network is used to deliver the message to the

originating UniPost Access Node. Fortunately, with local lines, the cost is either free or inexpensive and typically the quality of the connection is quite high. Therefore, there is a reasonable connection, and thus, a relatively fast transmission between the original facsimile machine 60 and the Toronto UniPost Access Node 6. Similarly, there is a fairly efficient transfer at the other end between Tokyo UniPost Access Node 8 and the final facsimile machine indicated as 82 if the originating leg of the transmission is slow, it typically does not increase the cost substantially, as it is a local call. Similarly, if the last leg of the transmission is slow, it is not particularly expensive, as it is again a local call. By redirecting the transmission, the high quality of the data transmission network is utilized, and thus, the cost for this portion of the transmission is also low.

This would be in contrast to the same transmission which is sent over a public switched telephone network to the facsimile machine 82. In that case, because of the various steps and the fact that that system has not been designed specifically for data transmission, the transmission rates are quite low and are really determined by the originating facsimile machine, the receiving facsimile machine and the quality of the communication channel therebetween. Often, because of the very substantial distance involved, even if the originating facsimile machine and the receiving facsimile machine have high rates of data transfer, the communication channel can be the limiting link and result in very slow transmission speeds and quite high costs. There can be a substantial cost saving with the method described, and the elimination of busy signals for the sender which uses the data communication network for the most important portion of the communication path. Figure 5 also shows how this UniPost system can be used for providing a direct telephone link using the data transmission network involving INTERNET. In this case,

voice is transmitted digitally and a live communication is maintained between Toronto UniPost Access Node 6 and Tokyo UniPost Access Node 8. Each of these have formed a live communication with the originating telephone set and the receiving telephone set. This can thus provide the subscriber with a further cost advantage in completing his international communications or other long distance communications.

The discount long distance voice messaging requires that each UniPost Access Node is able to accept and digitize voice calls. The actual data communication link utilizes protocols and routing logic which

ensures that the digitized voice packets remain in sequence from sender to recipient. As with long distance facsimile calls, the call originator will dial the local UniPost Access Node and enter his account and the number of the recipient. The UniPost Access Node will establish a packet path between the originating UniPost Access Node and the destination UniPost Access Node closest to the recipient. The destination UniPost Access Node will then place a local call to the recipient and deliver the voice message.

The present system also allows UniPost to encrypt transmissions between UniPosts and avoid inadvertent disclosure to others. For example, encryption and decryption are carried out by UniPost using state of the art technology, and thus, the transmission over INTERNET or other data networks is protected. This security is provided transparently to the sender and the receiver and provides security generally corresponding to traditional non-encrypted facsimile transmissions. Additional security can include predetermined encryption of the communication on either of the first or last telephone legs of the communication. For example, communications between a subscriber and UniPost can be encrypted in a predetermined manner and, if desired, the last leg can be encrypted in a predetermined manner. A subscriber can specify or choose

various levels of security for different messages or retrieval of different messages.

As previously described, the system can also utilize other technology for forced delivery of any of the communications. This typically involves a signal being sent to the subscriber which is not necessarily a telephone based signal. For example, pager communications can be used where the terminal recognizes that its address is included in the broadcast signal and provides proper alert. This alert can be recognized by the machine to complete a communication to the UniPost Access Node or it can merely alert the actual human subscriber. It is also possible for the access node to use voice notification where the UniPost Access Node out-dials a preselected telephone number and plays a voice message indicating that a message has been received. Depending upon the number specified, a voice message may be played back to a normal telephone or into a voice mail system.

The present invention also has particular application as a back-up system used in combination with call forwarding technology. In this way, businesses can have this as a back-up where if a particular number is busy or not answered, the call is forwarded to the UniPost Access Node, which accepts the call and then eventually causes it to be transmitted out to the particular party or is available for retrieval. Multiple reception of various types of communication is provided without the subscriber adding further communication.

There are other digital data networks other than INTERNET which can also be utilized and INTERNET is described herein as it is the most common and perhaps has the widest subscribers of E-Mail. The invention is not limited to the INTERNET. The drawings have also referred to various UniPosts in different countries, but it can well be appreciated that various UniPosts can be provided throughout a large geographical area, such as the United States. UniPost Access Nodes could be provided in

Los Angeles, Washington, New York, Chicago, New Orleans, etc. In fact, UniPost Access Nodes may be desirable in all major cities. It is also possible to use a single facility and have a 1-800 or other toll-free number for a particular region, country or group of countries.

The following provides an example of the type of summary with which a user can be provided when he uses a computer to retrieve his messages from a UniPost Access Node. As can be appreciated, the UniPost Access Node can also provide a verbal summary of the various transmissions received as it includes synthesized voice transmission. By combining all messaging types in a single or centralized confidential source, the UniPost subscriber can utilize his PC as the receiving terminal for all his messages.

For example, a Toronto-based subscriber travelling Japan with a laptop PC would click on the UniPost software his PC, identifying UniPost Japan, causing the modem to dial the Tokyo UniPost Access Node (JAN) and identify the subscriber (Figure 3). The JAN would then display on the PC a directory of mailbox contents, for example

TYPE DATE TIME LENGTH SENDER IP STATUS

Voice 10 Sep 94 11:34:22 2.2 min 212-546-9112 Not Played Voice 11 Sep 94 08:13:41 3.5 min 636-8223 Not Played Voice 11 Sept 94 14:58:17 1.5 min Unknown Caller Played

Facsimile 09 Sep 94 10:04:31 5 Pages Acme Fireworks Rec OK Facsimile 10 Sep 94 11:34:51 7 Pages 313-756-7781 Viewed

Facsimile 11 Sep 94 15:07:27 3 Pages Benton-Clear Rgc OK

Text File 08 Sep 94 09:23:12 4235 Bytes kjohnson@tonalick.com Rec OK Binary File 0 SCP 12.34.51 125912 Bvttas CIs:77605.171 Rec OK

Video IQ Sep 94 28 Seconds thalcvfsvideoclips.com Rec OK

While viewing the current mailbox directory, the subscriber can select any message for playback or display, as follows:

- A voice message can be played back through the PC speaker or sent to a telephone.
- A fax message can be displayed, annotated, rotated, edited, cleaned, or retransmitted.
- A full motion video file can be viewed using a video playback application.
- Any other file type can be processed by the appropriate application in the subscriber's PC, such as a text editor, word processor, spreadsheet, graphics viewer, or database.
- The subscriber can select individual messages for downloading, deleting, forwarding, or broadcasting.

By delivering all message types into the PC, the subscriber is able to save voice, fax, video, E-Mail, and other messages types under any subdirectory within his PC. Therefore, the subdirectory associated with, for example, a particular client could contain voice messages, facsimiles, video clips, E-Mail, or any other file type associated with that client.

Because of the distributed UANs, the travelling subscriber is not forced to make a long distance call from a telephone back to his home voice mail system in order to retrieve his messages. A single local call delivers all message types to his PC. A traveller using an office voice mail system, or a voice mail service offered by his local telephone company, will always have to call back to his home city in order to retrieve messages. This approach also applies within a country. The present invention is not limited to the use of land based telephone lines and is used with cellular or other accepted telephone transmission arrangements or other two-way communication arrangements.

Although various preferred embodiments of the present invention have been described herein in detail, it will be appreciated by those skilled in the art that variations may be made thereto without departing from the

spirit of the invention or the scope of the appended claims.

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